**Oracle Corporation installs its own substation, and realizes new efficiencies and financial benefits of a full-featured power management system from Schneider Electric.**

## Introduction

Oracle Corporation, the software giant based in Redwood Shores, California, is the world's leading supplier of information management software. Its products operate in everything from personal digital assistants to global information networks.

For Oracle's thousands of software developers, as well as customers that depend on non-stop, 24-hour-a-day technical support, power interruptions can be extremely costly. "It can mean as much as 5 to 10 million dollars per day for us in lost sales and productivity," states Jeff Byron, former Corporate Utility Manager at Oracle. "It also affects our customers who have mission-critical support needs."

## Options for high reliability

Oracle's need for reliable power was the driving force behind setting up its own substation, a 13 MW electrical distribution system, and a power management system. Savings in electricity costs were an added benefit. The project's total budget was $6 million, with an estimated payback period of three years. Oracle first considered purchasing electricity from the local utility at primary voltage, 12 kV, also known as voltage buy-up. However, the utility feeder to Oracle would still be shared with residential

## Goal

A high performance, high-quality electrical distribution system that supports customers with mission-critical needs, as well as Oracle's thousands of software developers.

## Story

Working with Schneider Electric, Oracle Corporation implemented its own innovative power distribution strategy, which is now paying dividends on its campus.

## Solution

Deploying a full-featured power management system including:

1. EcoStruxure™ Power Monitoring Expert*

2. PowerLogic advanced power meters

## Results

- In one year, system measure 30 utility-side transient events
- ROI of three years
- Continuous savings made by identifying areas of high energy usage, improving energy efficiency, and auditing utility bills
- Setting the framework as company moves towards aggregate energy reporting for all its campuses

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and other non-industrial loads, and they would be subjected to several outages per year.

Instead, Oracle decided to intercept the 60 kV circuit from the utility's transmission line that passes over the Oracle campus. Since the 60 kV circuit's unplanned outage rate proved to be more reliable, at less than one event per five years, and payback was favorable, Oracle's board of directors approved the project and construction began.

## Operation and maintenance

Once Oracle became owner/operator of a 13 MW distribution system, it could no longer rely on the local utility to provide operation and maintenance of the substation. Oracle was also responsible for the potential repair of miles of underground cable and 16 sets of secondary switches and transformers.

To reduce the risks of running their own electrical distribution, Byron selected a power management system from Schneider Electric.

Full-featured power meters are installed at the substation and at the transformer of each critical building — directly connected to the corporate Ethernet network by 10BaseT and 10BaseFL links. Desktop access to power system data is available via EcoStruxure™ Power Monitoring Expert*.

Oracle valued the system's scalability, affordability, and revenue-accurate metering. The system also offers growth potential to monitor additional off-site locations and provides access for multiple simultaneous users.

Oracle employs the system for:

- monitoring harmonics, transients, waveforms, sags/swells, and other disruptions
- monitoring substation operation, switches, and alarms
- tracking energy use, peak demand, time of use, and power factor
- automatically reading meters
- paging facility personnel during alarms
- reading temperatures, pressures, and oil levels in main and secondary transformers

## Disturbance sources and solutions

The metering and reporting system has already helped the company identify sources of, and corrective actions for, many potentially damaging disturbances. In one year, the system measured more than 30 utility-side transient events, which Byron can immediately compare against industry-standard CBEMA disturbance tolerance curves using the software.

Byron also set up alarms to trigger on undervoltage, as well as temperatures and oil levels in secondary transformers. When a preset condition is reached, the meter sends an alarm to the power

# 3 years
ROI of project

## Power management platform includes:

- Software: real-time control and monitoring software packages that provide energy information, whenever and wherever you need it.
- Intelligent power meters: highly accurate, and supply the data to identify energy savings, increase operational efficiency, and reduce energy costs.
- Power factor correction: to reduce power losses and process-related voltage fluctuations, and mitigate harmonics to avoid voltage and current distortion.

"There is an evolving need among commercial customers to want better power quality — and the ability to measure power quality is the starting point. With these meters it's not that difficult to take the next step, and not just buy bulk power by the kilowatt-hour, but buy premium power one cycle at a time."

*— Jeff Byron, former Corporate Utility Manager at Oracle*

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management software, "a situation I can immediately see on-screen in my office," he explains.

This gives Byron a real-time view of his critical loads. Moreover, "if a fault hits when I'm away from my office, even at home, I get pages from the system within 30 seconds." Power quality is also monitored at the substation's incoming 60 kV. If there is a disturbance, "in a matter of seconds, I know whose fault it was. If it's the utility's fault, I'm on the phone to their transmission dispatch within minutes. If it originated on our side, we fix the problem." Byron explained.

### New performance standards for energy providers

In addition to helping Byron decide on corrective actions, the power quality information lets him measure an Energy Service Provider's ability to meet performance requirements.

Byron believes that it's not enough for ESPs to be focusing solely on price and sell bulk power cheaper than the utility. "There is an evolving need among commercial customers to want better power quality — and the ability to measure power quality is the starting point. With these meters it's not that difficult to take the next step, and not just buy bulk power by the kilowatt-hour, but buy premium power one cycle at a time."

Oracle's local utility, Pacific Gas & Electric (PG&E) sees a growing number of commercial customers concerned about power quality. Byron realizes that this power probably won't come at bargain rates and may even cost more. Yet he firmly believes that other companies would be willing to pay more for better electricity when they realize what the productivity improvements should be.

### Increased knowledge and control

Byron also appreciates the freedom of monitoring critical power aspects of the campus himself as he no longer depends on the local utility for information, or a consultant to diagnose a problem.

Power quality monitoring has proven its value to Oracle. More savings are being realized by identifying areas of high energy usage, improving energy efficiencies, and auditing utility bills. Meters will be added at the first site and other campuses, then linked together as the company moves toward aggregate energy reporting for all its campuses.

"When a preset condition is reached, the meter sends an alarm to the software, a situation I can immediately see on-screen in my office. If a fault hits when I'm away from my office, even at home, I get pages from the system within 30 seconds."

— *Jeff Byron, former Corporate Utility Manager at Oracle*

# Eco Struxure™
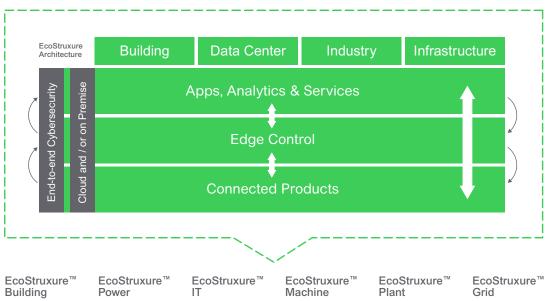## Innovation At Every Level

### IoT-enabled solutions that drive operational and energy efficiency

EcoStruxure is Schneider Electric's open, interoperable, IoT-enabled system architecture and platform.

EcoStruxure delivers enhanced value around safety, reliability, efficiency, sustainability, and connectivity for our customers.

EcoStruxure leverages advancements in IoT, mobility, sensing, cloud, analytics, and cybersecurity to deliver Innovation at Every Level including Connected Products, Edge Control, and Apps, Analytics & Services. EcoStruxure™ has been deployed in 480,000+ sites, with the support of 20,000+ system integrators and developers, connecting over 1.6 million assets under management through 40+ digital services.

### One EcoStruxure architecture, serving 4 End Markets with 6 Domains of Expertise

| EcoStruxure Architecture | Building | Data Center | Industry | Infrastructure |
|---|---|---|---|---|

End-to-end Cybersecurity | Cloud and / or on Premise

Apps, Analytics & Services

Edge Control

Connected Products

| EcoStruxure™ Building | EcoStruxure™ Power | EcoStruxure™ IT | EcoStruxure™ Machine | EcoStruxure™ Plant | EcoStruxure™ Grid |
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### Connected Products

The Internet of Things starts with the best things. Our IoT-enabled best-in-class connected products include breakers, drives, UPSs, relays, sensors, and more. Devices with embedded intelligence drive better decision-making throughout operations.

### Edge Control

Mission-critical scenarios can be unpredictable, so control of devices at the edge of the IoT network is a must. This essential capability provides real-time solutions that enable local control at the edge, protecting safety and uptime.

### Apps, Analytics & Services

Interoperability is imperative to supporting the diverse hardware and systems in building, data center, industry, and grid environments. EcoStruxure enables a breadth of agnostic Applications, Analytics, & Services for seamless enterprise integration.

### Find out more about EcoStruxure

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